(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
18 December 2003 (18.12.2003)

PCT

(10) International Publication Number
WO 03/105287 A1

(51) International Patent Classification[7]: H01R 31/02

(21) International Application Number: PCT/IT03/00299

(22) International Filing Date: 20 May 2003 (20.05.2003)

(25) Filing Language: Italian

(26) Publication Language: English

(30) Priority Data:
VI2002A000123 6 June 2002 (06.06.2002) IT

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(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*
— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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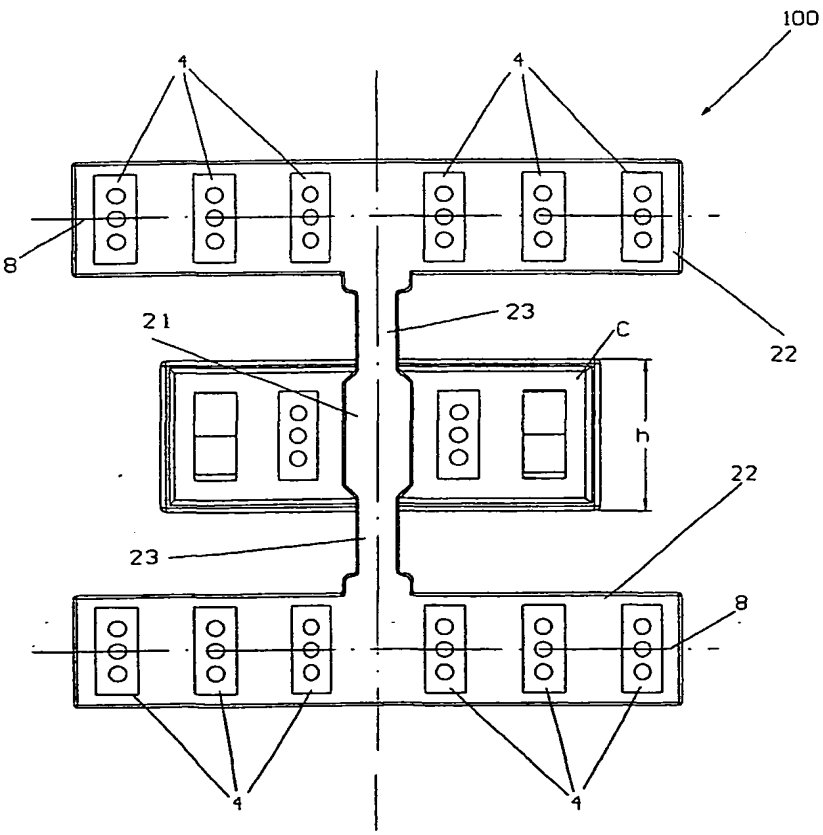
(54) Title: MULTI-SOCKET ADAPTOR



(57) Abstract: The invention realises a multi-purpose adaptor (1, 100, 101, 102, 103, 104, 105, 106) comprising an adaptor body (2) provided with a plug (3) insertable into a wall socket (P) and suited to supply a plurality of sockets (4, 4a, 4b). The adaptor body (2) comprises a first element (21, 21b, 21e) that houses the plug (3) and a second element (22, 22a, 22c, 22d) that houses the sockets (4, 4a) the first (21, 21b, 21e) and the second element (22, 22a, 22c, 22d) being connected to each other mechanically by means of a connecting element, (23, 23c, 23d, 23e) positioned transversally to the axis (31) of the plug (3).

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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

MULTI-SOCKET ADAPTOR

The invention relates to a multi-purpose adaptor particularly suitable for being shunted in a wall socket whereon it is applied in a stable manner.

It is known that temporary connection of electrical equipment to the main supply circuit is generally realised by inserting the respective supply plugs into corresponding wall sockets connected to the main distribution line installation.

More precisely, the sockets are housed in special encasing boxes that generally contain several electric devices, called electrical "socket bodies", such as sockets, switches, buttons, etc..

In both domestic and industrial fields it is known that it is very often necessary to connect several pieces of electrical equipment to a single wall socket.

This is realised by shunting to this socket, a multi-purpose adaptor substantially composed of an adaptor body provided with a plug suited to be inserted into a wall socket, and with three or more sockets electrically connected to the plug itself.

More precisely, the plug is positioned on the rear of the adaptor body while the various sockets, which can be dual-type or multi-standard, are lodged on the front and sides.

In particular, a first socket is positioned co-axially to the plug, and the remaining sockets are distributed on the side surfaces of the adaptor body with the axes positioned at right angles to the plug axis.

The installation foresees that the user firstly inserts the plug into the wall socket, and then inserts the various electrical equipment supply plugs in the available shunt sockets.

A first drawback is represented by the fact that the installation of a multi-purpose adaptor of the type described prevents access to any electrical devices, switches, sockets, and buttons that are located adjacent to the wall socket wherein the adaptor is inserted.

In fact, the adaptor body is developed on a plane that is substantially parallel to the wall surface, thus preventing access to the electrical devices, switches, sockets, and that are located adjacent to the wall socket.

Another drawback is represented by the limited number of sockets that can be shunted from a wall socket.

To prevent these drawbacks, at least partially, mobile type multiple sockets can be used.

These comprise substantially a box element that houses a plurality of electric sockets, and that is provided with a supply cable of variable length equipped with a plug at an end for the electricity supply of the aforesaid sockets.

A first drawback of mobile multiple sockets is represented by the fact that they must be placed on the floor creating well-known problems.

A further drawback linked with the aforesaid problem is represented by the fact that the mobile socket being positioned on the floor, can be subject to accidental impact, sometimes causing involuntary plug removal.

The object of the present invention is to overcome said drawbacks.

In particular, a first object of the invention is to realise a multi-purpose adaptor that permits several pieces of electrical equipment to be connected temporarily to a single wall socket connected to the main supply circuit.

Another object is to realise a multi-purpose adaptor, that after insertion into the corresponding wall socket permits access to other eventual electrical elements housed in the same walled box.

A further object is to realise a multi-purpose adaptor that after installation, is similar in function and appearance to a set of wall sockets.

Another object is to realise a multi-purpose adaptor suited to receive plugs also of various standards.

Another object is to realise a multi-purpose adaptor that does not require fixing elements.

Another object is to create a multi-purpose adaptor that is compact and space saving.

Last but not least object is to realise a multi-purpose adaptor that is economical and versatile.

Said objects are achieved with a multi-purpose adaptor that, according to the main claim, comprises an adaptor body provided with at least one plug for insertion into a wall socket and suitable to supply a plurality of sockets, being characterised in that said adaptor body includes a first element to house said plug, and at least a second element to house said plurality of sockets, said first and said at least one second element being mechanically connected to each other through at least one connection element positioned transversally to the axis of said at least one plug.

Advantageously, the proposed multi-purpose adaptor permits an increase in the number of connections to the main electricity circuit, while guaranteeing access to the

other devices housed in the same encased box.

Once more, advantageously, the proposed adaptor, after insertion into the corresponding wall socket, substantially comprises an expansion of the access point to the main electricity installation.

Once more, advantageously, it does not require fastening supports since the application to the socket guarantees its fixation.

Said objects and advantages will be explained more clearly in the description of a preferred embodiment which is indicative but by no means limiting with reference to the appended drawings, in which:

- figure 1 shows an axonometric view of the multi-purpose adaptor object of the invention inserted into a wall socket;
- figure 2 shows an axonometric view of the multi-purpose adaptor shown in figure 1;
- figure 3 shows a front view of the multi-purpose adaptor shown in figure 1 applied to a wall socket;
- figure 4 shows a side view of the multi-purpose adaptor shown in figure 1;
- figure 5 shows a front view of a different embodiment of the multi-purpose adaptor shown in figure 1 inserted in a wall socket;
- figure 6 shows a front view of another embodiment of the multi-purpose adaptor shown in figure 1 inserted in a wall socket ;
- figure 7 shows an axonometric view of a different embodiment of the multi-purpose adaptor shown in figure 1;
- figure 8 shows an axonometric view of another embodiment of the multi-purpose adaptor shown in figure 1 ;
- figure 9 shows an axonometric view of a further embodiment of the multi-purpose adaptor shown in figure 1 ;
- figure 10 shows an axonometric view of a embodiment of the multi-purpose adaptor shown in figure 7;
- figure 11 shows an axonometric view of another embodiment of the multi-purpose adaptor shown in figure 1;
- figure 12 shows a configuration that can be assumed by the multi-purpose adaptor shown in figure 9;

The multi-purpose adaptor object of the present invention is represented in figures from 1 to 4 wherein it is identified throughout by the numeral 1.

It comprises an adaptor body 2 provided with a plug 3 which can be inserted into

a wall socket P, suited to supply a plurality of sockets 4 for temporary connection to the main electricity circuit of the supply plugs S of various electrical devices, not illustrated.

The invention foresees that the adaptor body 2 be composed of a first element 21 housing the plug 3 and a second element 22 housing the sockets 4, connected to each other mechanically and electrically through a rigid connecting element 23 positioned transversally to axis 31 of plug 3.

In particular, the connecting element 23 is positioned at right angles to axis 31, although other embodiments foresee different angles.

The three elements 21, 22 and 23 are produced in a single block obtained for example by moulding, wherein all the necessary electrical connections between plug 3 and the various sockets 4 are located.

It is important to note that the connecting element 23 has a length 5 visible in figure 2 such that the distance 6 between axis 31 of plug 3 and the second element 22, is substantially equal to half the width L of the plate C that covers the encased box B wherein wall socket P is housed.

It should also be noted that the width 7 of the first element 21 is such that it does not encroach the space occupied by the modules or electrical socket bodies D1, D2, D3, D4 located next to the wall socket P.

This guarantees advantageously the access to all the electrical socket bodies housed in the encased box B, even when the multi-purpose adaptor 1 is inserted in the respective wall socket P.

In different embodiments, not illustrated here for the sake of brevity, the length 5 of element 23 can vary while still remaining greater than or equal to half of the measurements Height H or Width L, of plate C necessary to guarantee access to the electrical socket bodies D1, D2, D3, D4 even when the adaptor 1 is inserted.

As regards the sockets 4 these are positioned on a plane transversal to axis 31 of plug 3, arranged adjacent to each other in a line along a substantially rectilinear axis 8.

These are composed of a set of sockets of the same standard having pins and slots protected from accidental and/or voluntary direct contact. Alternatively, the set could comprise sockets also of different standards.

An alternative embodiment identified globally by the numeral 100 in figure 5 differs from the previous one in that it presents two sets of sockets 4 housed in the same number of second elements 22.

Another alternative embodiment identified globally by the numeral 101 in figure 5 differs from the previous one for the position of the sockets 4.

A further alternative embodiment identified globally by the numeral 102 in figure 7 differs from the previous one in that the sockets 4 are positioned also along the side wall 25 of the second element 22a.

This permits advantageously to further increase the number of usable sockets and to reduce the overall adaptor-plug size.

Another alternative embodiment identified globally by the numeral 103 in figure 8 differs from the previous ones in that the first element 21b also houses a socket 4b positioned axially to plug 3.

A further alternative embodiment identified globally by the numeral 105 in figure 9 differs from the previous ones in that the connecting element 23c and the second element 22c are removably associated with each other.

More precisely they are mechanically and electrically connected through connecting means identified throughout with numeral 9.

Said connecting means 9 are preferably male female type 91, 92 and permit the replacement of the set of sockets 4 making the multi-purpose adaptor 102 adaptable according to the user's needs.

In particular, the second element 22c is provided with several female elements 91 not illustrated, positioned on its side surfaces and suited to receive the corresponding male element 92.

Therefore the user can choose the most suitable configuration according to their personal needs and the space available.

As regards the male female elements 91, 92 these could also be advantageously composed in plug-socket mode.

In any case the connecting means could also be of bayonet or another type provided that they guarantee the mechanical connection between elements 21, 22c, 23c and the electrical connection between plug 3 and sockets 4.

A further alternative embodiment identified globally by the numeral 105 in figure 10 differs from the previous one for the shape of the connecting element 23d and for the fact that the female element 92d is advantageously composed of one of the sockets 4, while the male element 91d is a plug.

Another alternative embodiment identified globally by the numeral 106 in figure 11 differs from the previous one in that the connection means 9 are positioned between the connecting element 23e and the first element 21e.

In particular, the element 21e comprises several female elements 92e to connect several male elements 91e belonging to the same number of socket sets. This permits the connection of several sets of sockets to the same plug 3 as shown in figure 12.

The installation foresees that the user inserts the multi-purpose adaptor 1 into the wall socket P that they intend using, and then inserts the various plugs S of the equipment to be supplied.

It should be noted that the thickness of plug 3 and of connecting element 23 is such that they do not encroach the space occupied by the electrical socket bodies D1, D2, D3, D4 adjacent to the wall socket P in use.

This, together with the fact that the set of sockets 4 is not positioned on a surface facing the encased box B, permits the achievement of the above-mentioned objects.

It should also be noted that the rear surface of the second element 22, as shown in figure 4, is advantageously in contact with the wall, thus guaranteeing greater stability for the adaptor inserted in the socket.

In different embodiments, the adaptor could be provided with a switch suited to open/close the supply circuit to the various sockets 4.

This could also include both cut-off devices and the known safety devices for control of the load applied to the sockets 4, as well as warning signal means suited to signal the connection or lack thereof of sockets 4 to the main supply circuit, such as for example luminous leds.

While the invention has been described with reference to the appended drawings, during the realisation step it could be subject to modifications that in any case remain within the same inventive concept expressed in the following claims and therefore protected by the present patent.

CLAIMS

1) Multi-purpose adaptor (1, 100, 101, 102, 103, 104, 105, 106) comprising an adaptor body (2) provided with at least one plug (3) insertable into a wall socket (P) and suited to supply a plurality of sockets (4, 4a, 4b) **characterised in that** said adaptor body (2) includes a first element (21, 21b, 21e) to house said plug (3) and at least one second element (22, 22a, 22c, 22d) to house said plurality of sockets (4, 4a), said first (21, 21b, 21e) and said at least one second element (22, 22a, 22c, 22d) being connected to each other mechanically by means of at least one connecting element (23, 23c, 23d, 23e) positioned transversally to axis (31) of said at least one plug (3).

2) Adaptor (1, 100, 101, 102, 103, 104, 105, 106) according to claim 1) **characterised in that** said at least one connecting element (23, 23c, 23d, 23e) is rigid.

3) Adaptor (1, 100, 101, 102, 103, 104, 105, 106) according to claim 1) or 2) **characterised in that** the distance (6) between said axis (31) of said at least one plug (3) and said at least one second element (22, 22a, 22c, 22d) is greater than or equal to the half of the width (L) of the plate (C) of the encased box (B) wherein said wall socket (P) is housed.

4) Adaptor (1, 100, 101, 102, 103, 104, 105, 106) according to claim 1) or 2) **characterised in that** the distance (6) between said axis of said at least one plug (3) and said at least one second element (22, 22a, 22c, 22d) is greater than or equal to the half of the height (H) of the plate (C) of the encased box (B) wherein the wall socket (P) is housed.

5) Adaptor (1, 100, 101, 102, 103, 104, 105, 106) according to any one of the previous claims **characterised in that** said plurality of sockets (4) is composed of at least a set of sockets (4, 4a) positioned adjacent to each other.

6) Adaptor (1, 100, 101, 102, 103, 104, 105, 106) according to claim 5) **characterised in that** said sockets (4, 4a) are positioned along a direction (8) substantially rectilinear.

7) Adaptor (1, 100, 101, 102, 103, 104, 105, and 106) according to any one of the previous claims **characterised in that** it also comprises at least one socket (4b) positioned axially to said plug (3).

8) Adaptor (102,) according to any one of the previous claims **characterised in that** certain said sockets (4a) are positioned on a side surface (25) of said at least one second element (22a).

9) Adaptor (1, 100, 101, 104, 105, 106) according to any one of the previous claims from 1) to 7) **characterised in that** said plurality of sockets (4, 4b) are positioned on a plane transversal to the axis (31) of said at least one plug (3).

10) Adaptor (1, 100, 101, 102, 103,) according any one of the previous claims **characterised in that** said first element (21, 21b), said at least one second element (22, 22a) and said at least one connecting element (23) are realised in a single piece.

11) Adaptor (104, 105,) according any one of the previous claims from 1) to 9) **characterised in that** said at least one connecting element (23c, 23d) and said at least one second element (22c, 22d) are connected to each other mechanically and electrically through a connecting means (9).

12) Adaptor (106,) according any one of the previous claims from 1) to 9) **characterised in that** said at least one connecting element (23e) and said at least one first element (21e) are connected to each other mechanically and electrically through a connecting means (9).

13) Adaptor (104, 105, 106,) according to claim 11) or 12) **characterised in that** said connection means (9) are male female type (91, 91d, 91e, 92, 92d, 92e).

14) Adaptor (104, 105, 106,) according to claim 13) **characterised in that** said male element (91, 91d, 91e) is a plug and said female element (92, 92d, 92e) is a socket.

15) Adaptor (105) according to claim 14) **characterised in that** said female element (92d) is one of said one plurality of sockets (4).

16) Adaptor (1, 100, 101, 102, 103, 104, 105, 106) substantially as described with reference to the appended drawings.

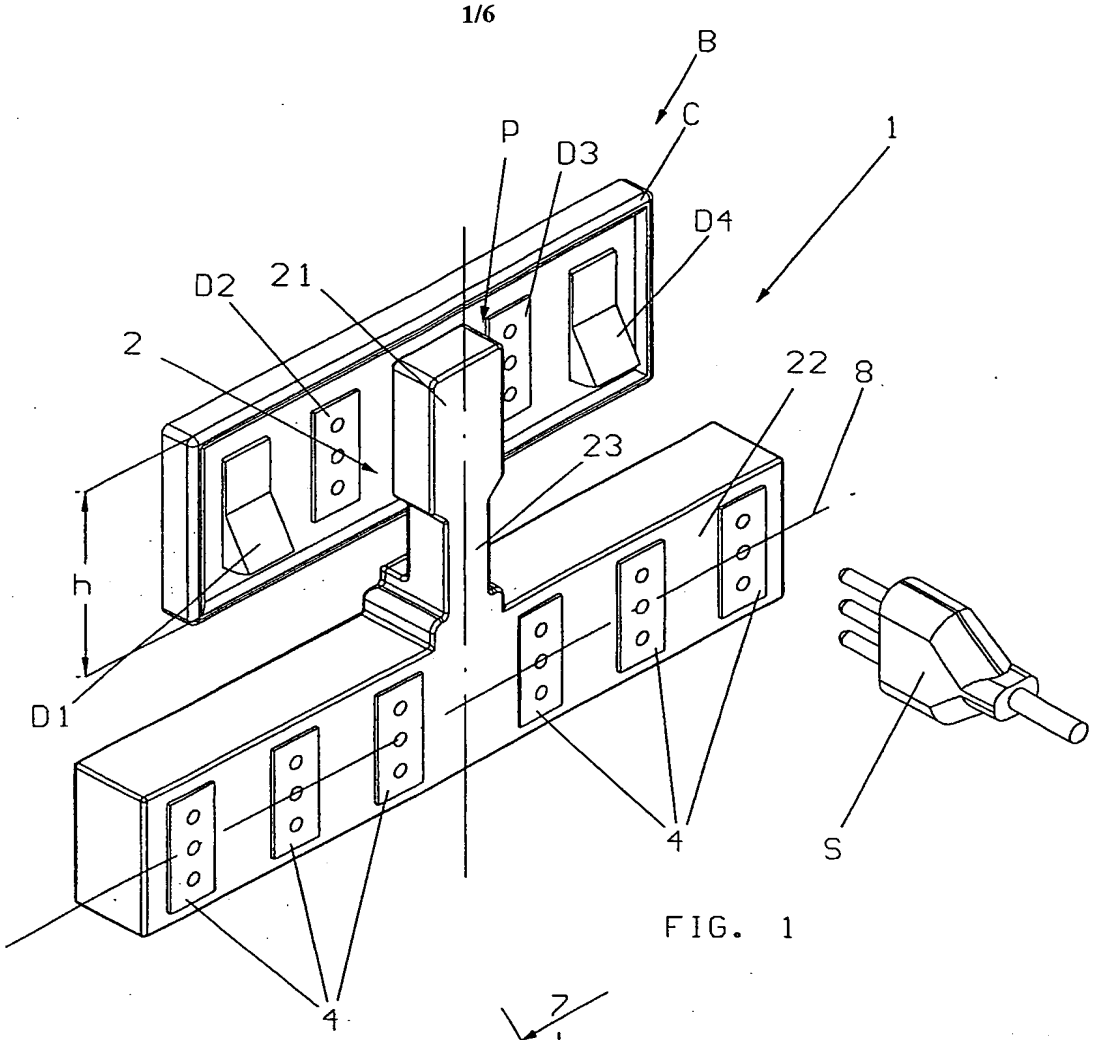

FIG. 1

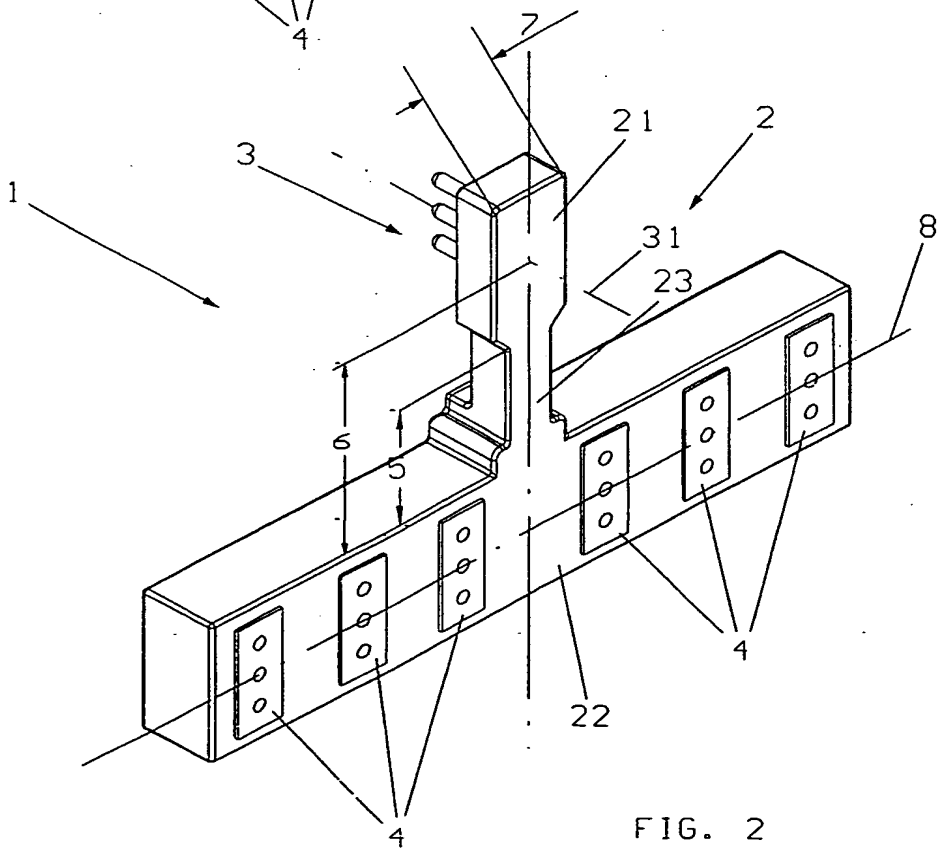

FIG. 2

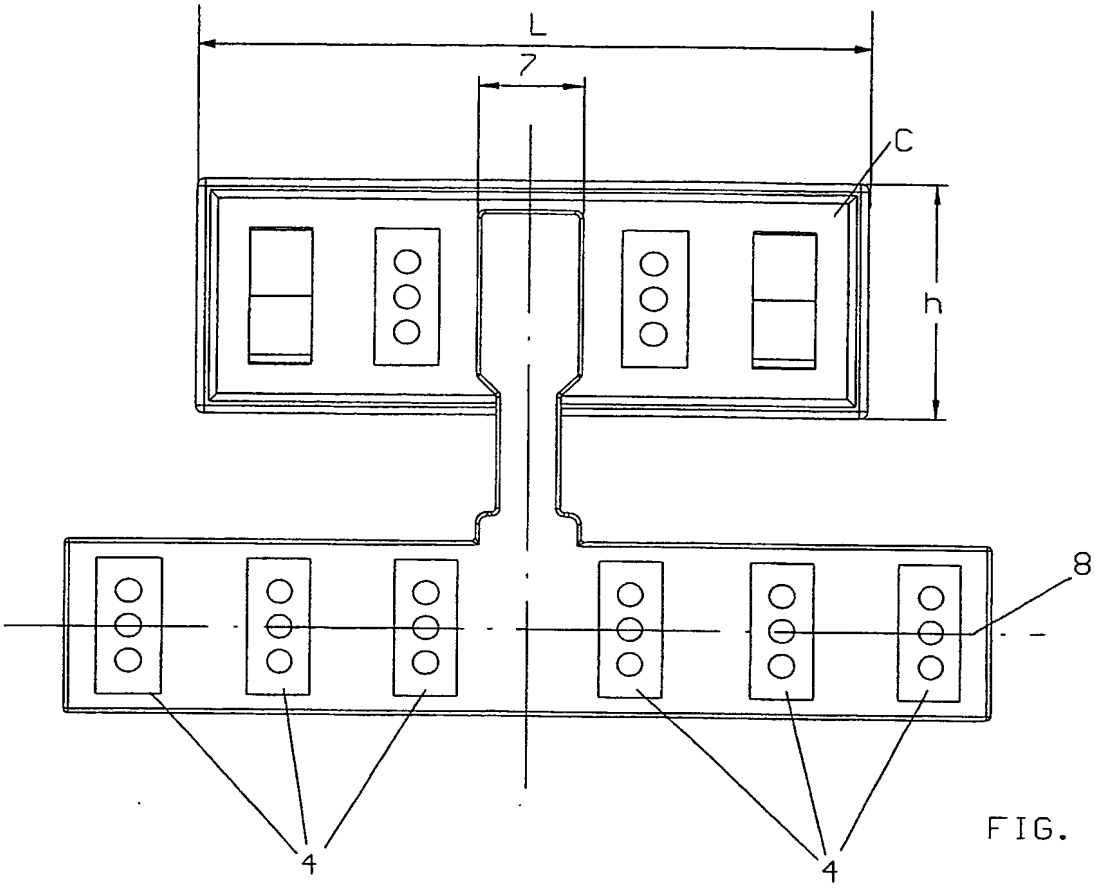

FIG. 3

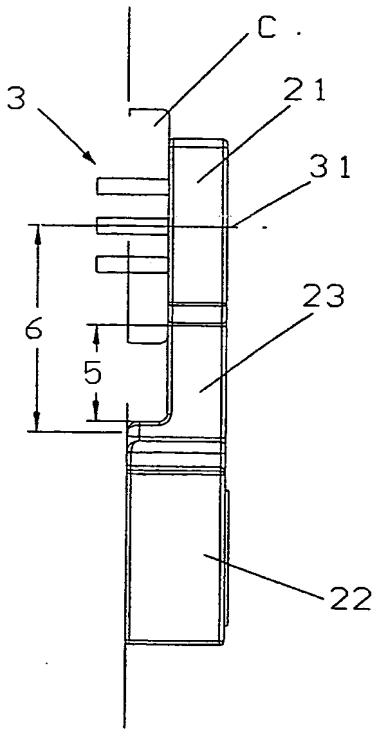

FIG. 4

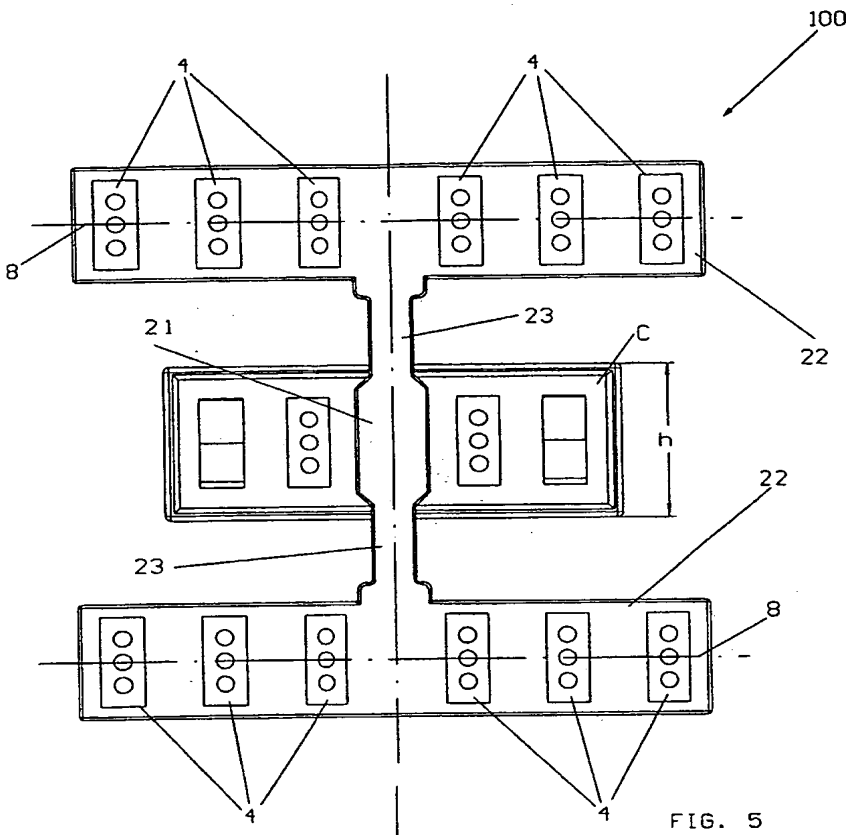

FIG. 5

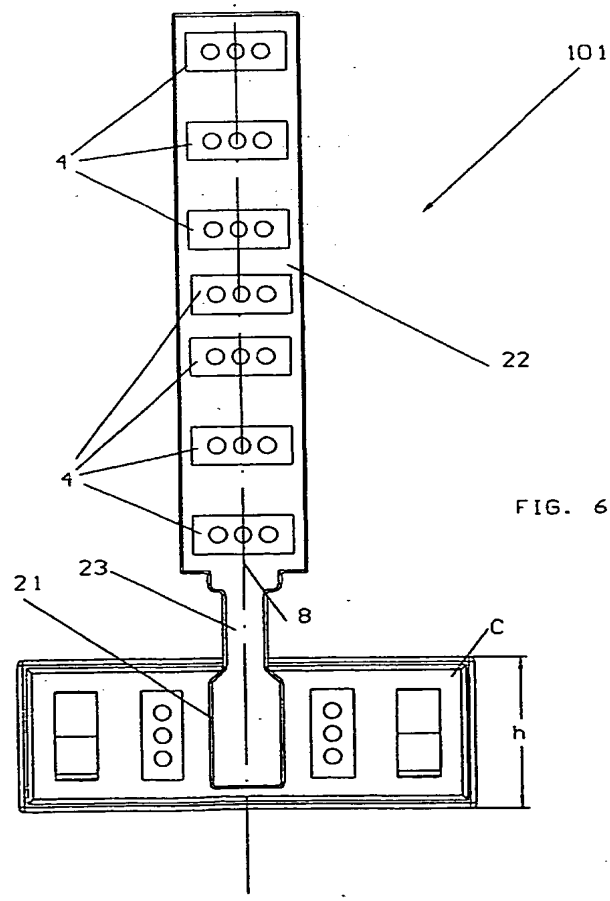

FIG. 6

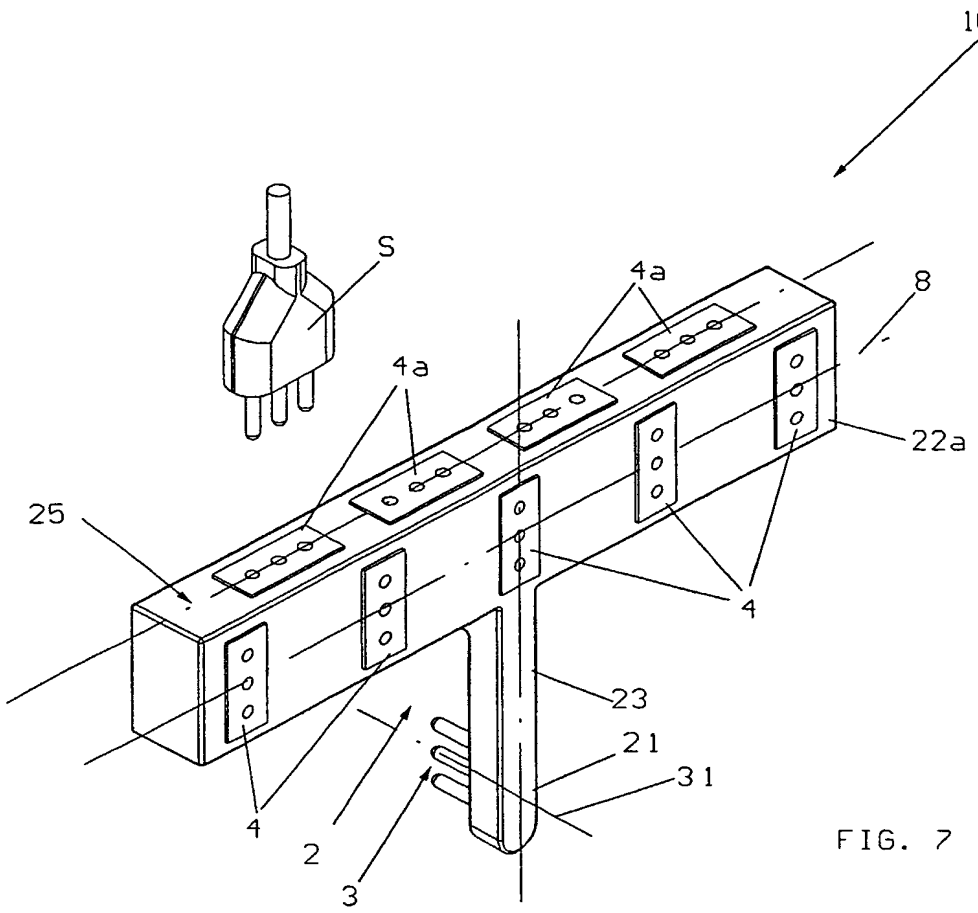

FIG. 7

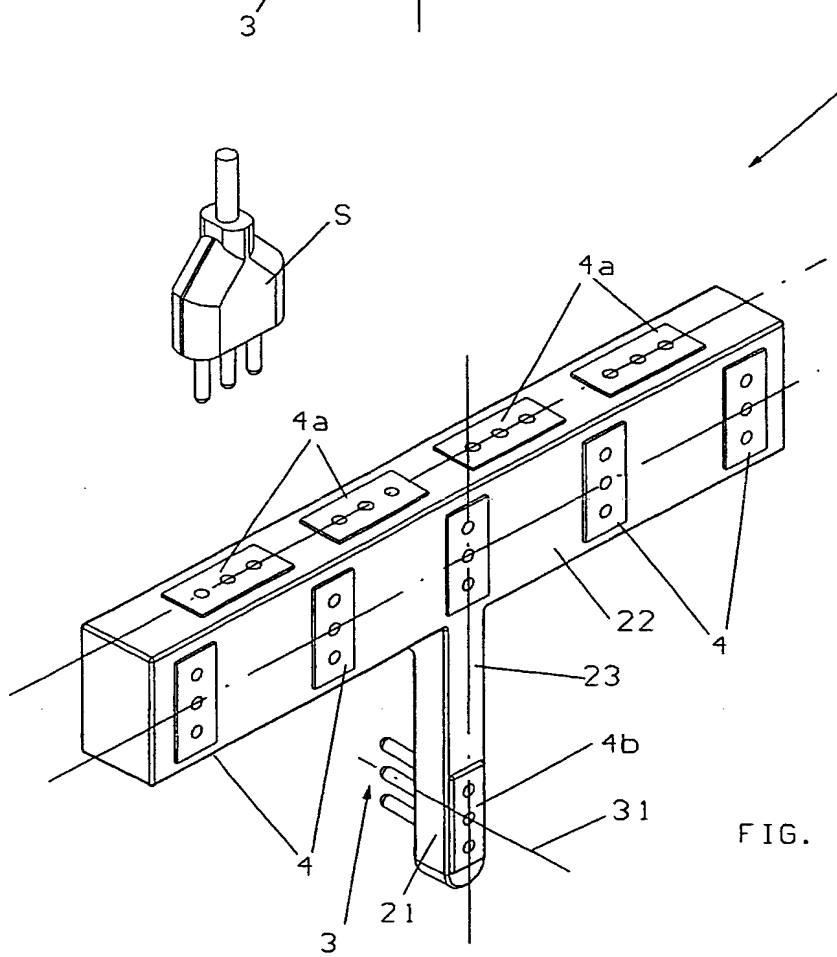

FIG. 8

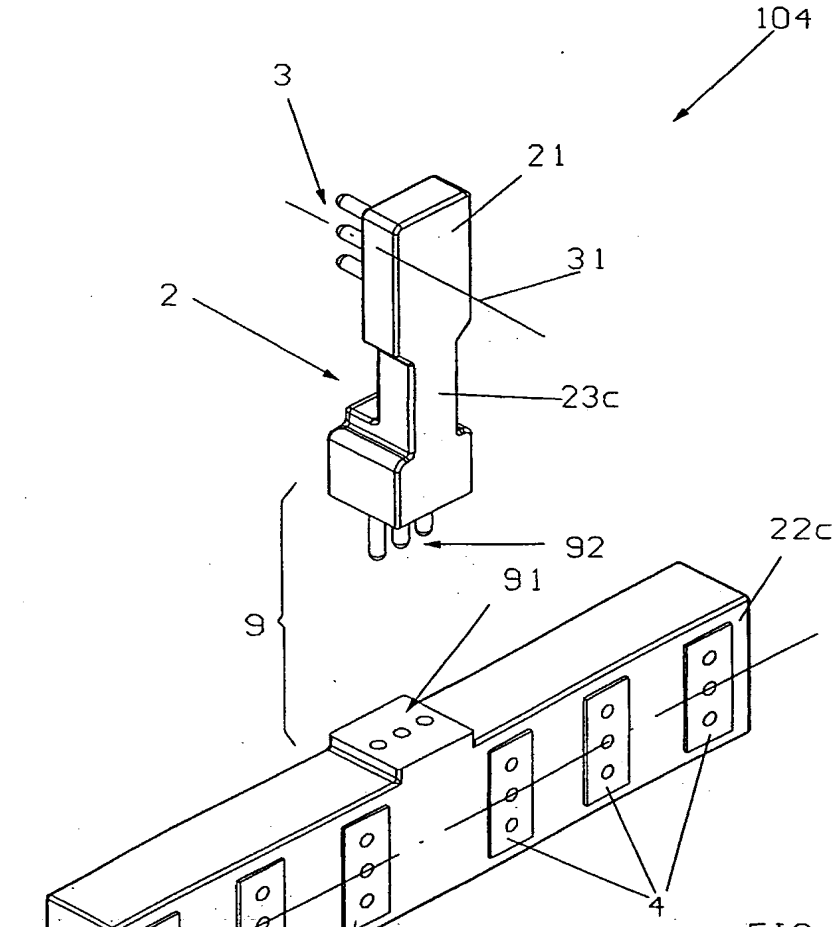

FIG. 7

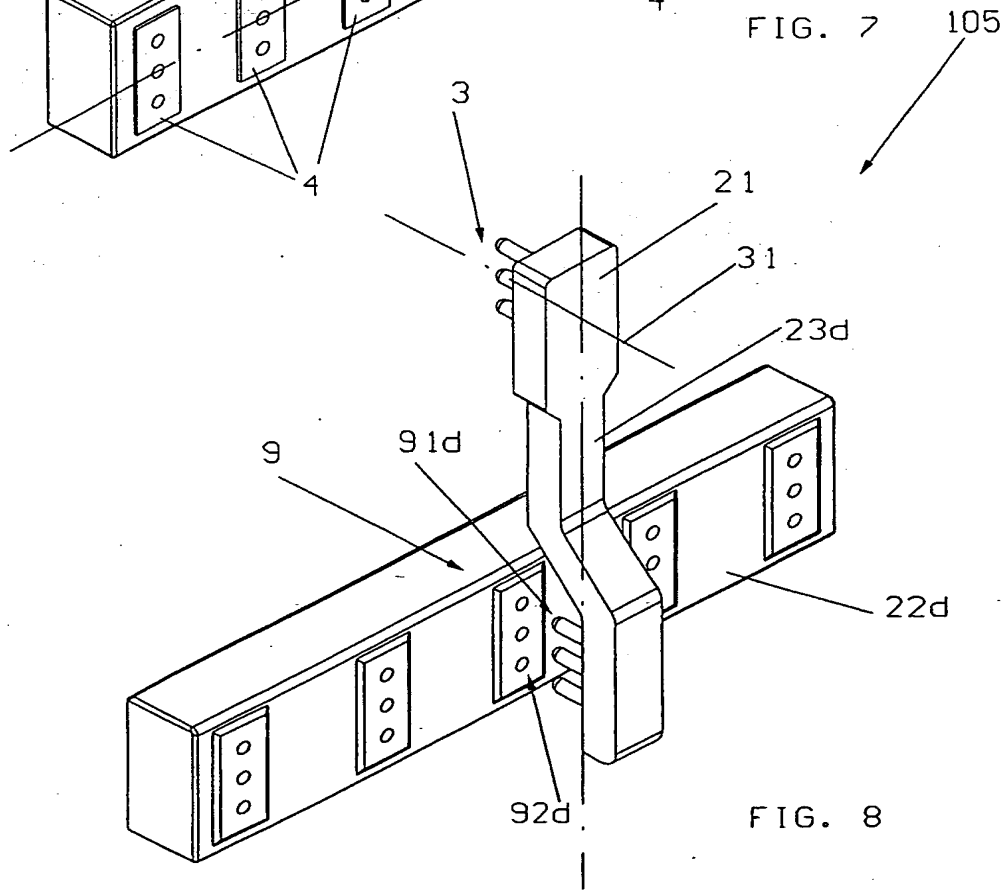

FIG. 8

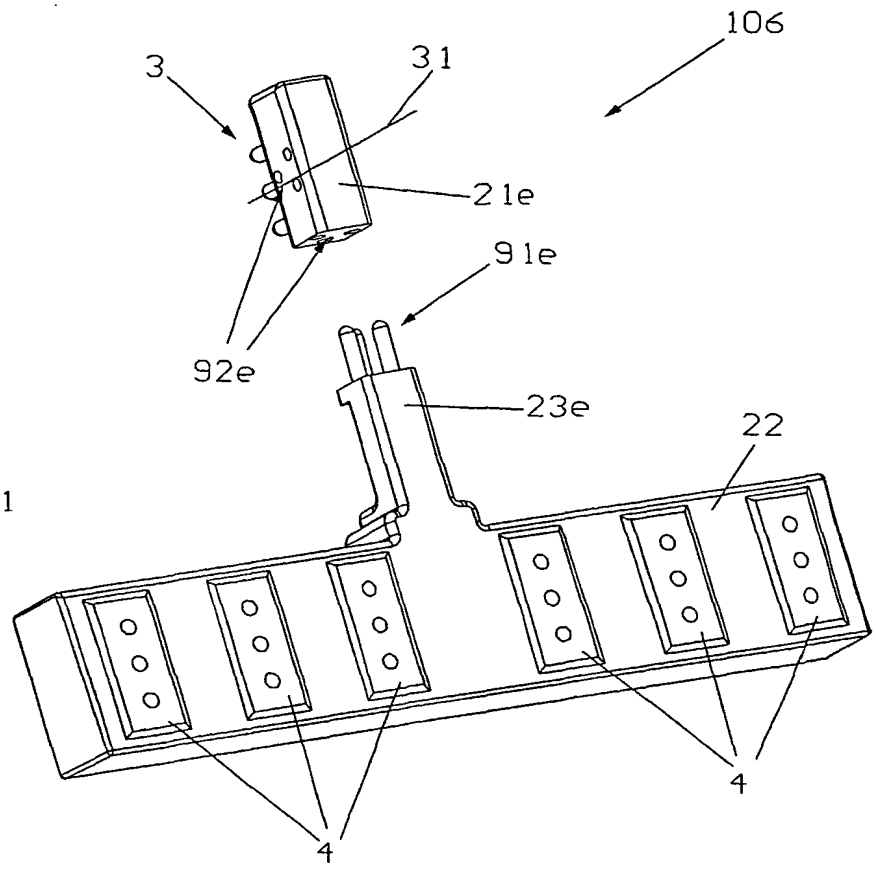

FIG. 11

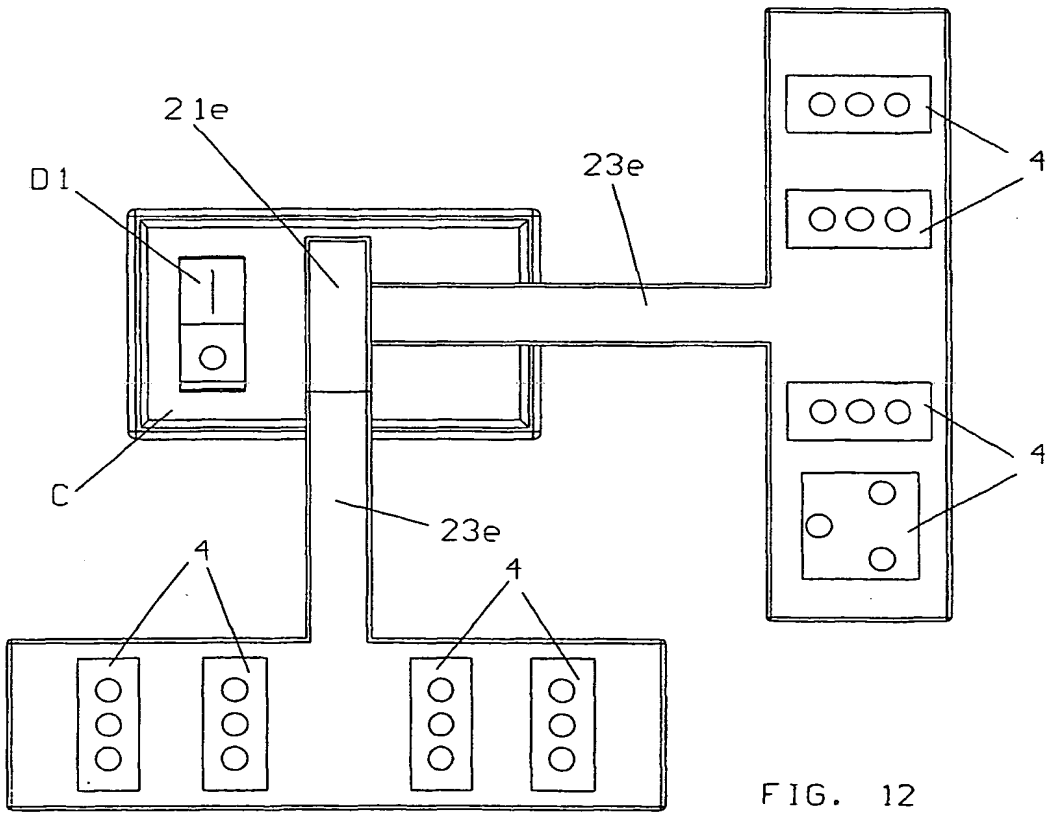

FIG. 12

INTERNATIONAL SEARCH REPORT

PCT/IT 03/00299

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 H01R31/02

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 H01R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)
EPO-Internal, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	WO 02 35663 A (SKOELDMARK OLLE) 2 May 2002 (2002-05-02) page 7, line 7 -page 10, line 18; figures 2A-4 page 12, line 29 -page 13, line 2; figure 15	1-6,8-16 7
Y	US 5 857 875 A (HSU I CHENG ET AL) 12 January 1999 (1999-01-12) column 2, line 12 -column 2, line 22; figure 4	7
A	US 5 044 971 A (HOLLINGSWORTH ELMONT F) 3 September 1991 (1991-09-03) column 4, line 32 -column 5, line 21; figure 4	11-15

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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Date of the actual completion of the international search	Date of mailing of the international search report
26 September 2003	07/10/2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Segerberg, T

Form PCT/ISA/210 (second sheet) (July 1992)

BNSDOCID: <WO_____03105287A1_I_>

INTERNATIONAL SEARCH REPORT

PCT/IT 03/00299

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0235663 A	02-05-2002	SE 517969 C2	06-08-2002
		AU 9247001 A	06-05-2002
		EP 1330858 A1	30-07-2003
		SE 0003832 A	24-04-2002
		WO 0235663 A1	02-05-2002
US 5857875 A	12-01-1999	DE 29720588 U1	02-04-1998
US 5044971 A	03-09-1991	AU 7950391 A	07-01-1992
		WO 9120115 A1	26-12-1991